IN THE CLAIMS:

Please cancel claims 2, 8, 10-11, 15-16 without prejudice or disclaimer, amend claims 1, 3-7, 9, 12-14, and add new claims 17-20 as follows:

1. (Currently Amended) A rotation drive control device of a three-phase DC motor, comprising:

a drive control unit;

a three-phase DC motor including three-phase coils and a rotor ~~in which such currents that a rotor does not responds~~,

wherein the drive control unit ~~are~~ sequentially ~~caused to~~ causes a first current that flows through any two of the three phase coils to detect [[the]] a polarity of [[a]] an induced voltage ~~induced~~ in each de-energized phase of the three phase coils, ~~thereby~~ so as to determine a direction of energization and a [[the]] corresponding phase coil through which [[the]] a second current is caused to flow to rotate the rotor~~, and the direction of energization thereof, whereby the currents are caused to flow according to the determination thereof to rotate the rotor,~~

wherein the drive control unit controls a start-up of the three-phase DC motor based upon a first determination in connection with the direction of energization and the corresponding phase coil,

wherein the rotor does not respond to the first current, and

wherein when the drive control unit determines a detected level of the induced-voltage of each of said two of the three phase coils is larger than a predetermined level, the drive control unit determines the direction of energization and the corresponding phase coil by using a detected polarity of each of said two of the three phase coils ~~a detection result of the two phases, of an induced voltage detection result of the three phases is an expected result, a detection result of the remaining one phase is ignored, and the corresponding phase coil through which the current is caused to flow~~ so as to rotate the rotor [[and]] based upon the direction of energization and the corresponding phase coil thereof are determined~~, whereby the currents are caused to flow according to said determination to rotate the rotor~~.

2. (Cancelled)

3. (Currently Amended) The rotation drive control device of three-phase DC motor according to claim 1~~2~~, ~~further including~~ wherein the drive control unit includes a comparator or an arithmetic circuit which determines whether [[the]] a detected level of the induced voltage of each phase of the three phase coils is larger or smaller than [[a]] the predetermined level, and registers which retain the results of determination every phases together with the polarity of the induced voltage in each de-energized phase of the three phase coils.

4. (Currently Amended) The rotation drive control device of three-phase DC motor according to claim [[2]]3, ~~further including~~ wherein the drive control unit further includes a decoder which decodes which decodes outputs of the registers and outputs a signal indicative in connection with the direction of energization and the corresponding phase coil ~~of the polarity detection result and a signal indicative of the level detection result and outputs a signal indicative of each energized phase~~.

5. (Currently Amended) The rotation drive control device of three-phase DC motor according to claim 4, wherein the drive control unit further ~~including~~ includes a ~~register which stores the output of the decoder, and~~ rotation determining unit [[means]] which compares a previous output of the signal indicative with a present output of the signal indicative ~~of the previous energized phase, which is stored in the register, with the present output signal of the decoder to thereby~~ so as to determine normal rotation or reverse rotation of the rotor.

6. (Currently Amended) A method of starting up a three-phase DC motor including three-phase coils and a rotor, ~~wherein such currents that a rotor does not responds, are~~ comprising:

sequentially ~~caused~~ causing a first current to flow through any two of the three phase coils to detect [[the]] a polarity of [[a]] an induced voltage ~~induced~~ in each de-energized phase of the three phase coils by a drive control unit driving and controlling the three-phase DC motor, thereby determining a direction of energization and a corresponding phase coil through which a second current is caused to flow to rotate the rotor;~~, and the level of the induced voltage is determined to decide the corresponding phase coil through which the current is caused to flow to rotate the rotor, and the direction of energization thereof, whereby the currents are caused to flow according to the determination thereof to start up the motor, said method comprising the steps of:~~

based upon determining a detected level of the induced voltage of each of two of the three phase coils is larger than a predetermined level, determining the direction of energization and the corresponding phase coil by using a detected polarity of each of the two of the three phase coils thereby rotating the rotor based upon the direction of energization and the corresponding phase coil thereof as determined;

driving the three-phase DC motor based upon a first determination in connection with the direction of energization and the corresponding phase coil, and

wherein the rotor does not respond to the first current

~~effecting the induced-voltage polarity detection and level determination on the coils for all three phases at the beginning of the start-up to thereby perform determination of the corresponding phase coil through which a current is caused to flow to rotate the rotor, and the direction of energization thereof ato perform energization according to said determination; and~~

~~after determination that the rotor is normally rotated, effecting the induced-voltage polarity detection and level determination on the coil for any one of the phases to thereby perform determination of the corresponding phase coil through which a current is caused to flow to rotate the rotor, and the direction of energization thereof, to perform energization according to said determination~~.

7. (Currently Amended) The method according to claim 6, further comprising [[the]] steps of:

~~storing the induced-voltage polarity detection result about the coils for the three phases; and~~

comparing a previous output of a signal indicative in connection with the direction of energization and the corresponding phase coil with a present output of the signal indicative in connection with the direction of energization and the corresponding phase coil thereby determining normal rotation or reverse rotation of the rotor ~~an induced voltage polarity detection result about the three-phase coils executed next with the previous detection result to thereby make a decision as to whether the rotor is normally rotated~~.

8. (Cancelled)

9. (Currently Amended) A rotation drive control ~~device~~ system of a ~~multi-phase~~ three-phase DC motor ~~in which such currents that a rotor does not responds~~ comprising:

a drive control unit including a driver, a current detection unit, a PWM signal generator, and a vector controller, said PWM signal generator including a triangular wave generator and a comparison unit; and

a three-phase DC motor including three-phase coils and a rotor,

wherein the drive control unit generates a current command value,

wherein the current detection unit executes a current detection of a current which flows through the three-phase coils,

wherein the vector controller generates a first indicative voltage corresponding to a first phase of the three-phase coils, a second indicative voltage corresponding to a second phase of the three-phase coils, and a third indicative voltage corresponding to a third phase of the three-phase coils by detecting a difference between a result of the current detection and the current command value,

wherein the PWM signal generator generates and outputs a first PWM signal, a second PWM signal, and a third PWM signal,

wherein the driver drives the three-phase DC motor based on the first PWM signal, the second PWM signal, and the third PWM signal,

wherein the triangular wave generator generates a positive phase triangular wave and a negative phase triangular wave, and

wherein when the first indicative voltage is an intermediate potential between a voltage value of the second indicative voltage and a voltage value of the third indicative voltage and changes between the voltage values of the second and third indicative voltages, the first PWM signal is generated by the comparison unit by comparing the negative phase triangular wave with the first indicative voltage, and the second PWM signal is generated by the comparison unit by comparing the positive phase triangular wave with the second indicative voltage,

wherein when the second indicative voltage is an intermediate potential between a voltage value of the first indicative voltage and a voltage value of the third indicative voltage and changes between the voltage values of the first and third indicative voltages, the second PWM signal is generated by the comparison unit by comparing the negative phase triangular wave with the second indicative voltage, and the first PWM signal is generated by the comparison unit by comparing the positive phase triangular wave with the first indicative voltage~~, in which the total current that flows through coils of the multi-phase DC motor is detected and compared with a current command value, a sine wave-shaped current is caused to flow through each coil according to the difference therebetween to thereby rotatably drive the motor,~~

~~wherein positive-phase and negative-phase triangular wave information are generated as comparison information for generating PWM control signals which control a driver for causing a drive current to flow through each coil, and the PWM control signal for the corresponding phase coil to which a voltage of an intermediate level is applied by the driver, of the respective phase coils, is generated using triangular wave information opposite in phase to triangular wave information used to generate the PWM control signals for other phase coils~~.

10-11. (Cancelled)

12. (Currently Amended) The rotation drive control device system of ~~multi-phase~~ three-phase DC motor according to claim 9, wherein ~~each of sample-and-hold signals, which provides timing for detecting the total current flowing through each coil, is generated so as to be synchronized with the rising edge or falling edge of the PWM control signal for the phase in which the command voltage value is intermediate, of the respective phases~~ the drive control unit further includes a sample-and-hold signal generator,

wherein when the third indicative voltage is an intermediate potential between a voltage value of the second indicative voltage and a voltage value of the first indicative voltage and changes between the voltage values of the second and first indicative voltages, the third PWM signal is generated by the comparison unit by comparing the negative phase triangular wave with the third indicative voltage, and the second PWM signal is generated by the comparison unit by comparing the positive phase triangular wave with the second indicative voltage,

wherein when the first indicative voltage is the intermediate potential between the voltage value of the second indicative voltage and the voltage value of the third indicative voltage and changes between the voltage values of the second and third indicative voltages, the sample-and-hold signal generator generates a sample-and-hold signal to synchronize with each of rising edges and falling edges of the first PWM signal, so as to give a detection timing in connection with the current detection,

wherein when the second indicative voltage is the intermediate potential between the voltage value of the first indicative voltage and the voltage value of the third indicative voltage and changes between the voltage values of the first and third indicative voltages, the sample-and-hold signal generator generates a sample-and-hold signal to synchronize with each of rising edges and falling edges of the second PWM signal, so as to give a detection timing in connection with the current detection, and

wherein when the third indicative voltage is the intermediate potential between the voltage value of the second indicative voltage and the voltage value of the first indicative voltage and changes between the voltage values of the second and first indicative voltages, the sample-and-hold signal generator generates a sample-and-hold signal to synchronize with each of rising edges and falling edges of the third PWM signal, so as to give a detection timing in connection with the current detection.

13. (Currently Amended) The rotation drive control ~~device~~ system of ~~multi-phase~~ three-phase DC motor according to claim 9, wherein ~~said multi-phase DC motor is a three-phase brushless motor, one of the control signals for the three-phases supplied to the driver~~ the third indicative voltage is set as a first fixed signal [[fixed]] so as to set the third PWM signal as a second fixed signal to a 100% or 0% duty~~, and the PWM control signals for the remaining two phases are generated~~

~~using triangular wave information placed in an reverse phase relationship with one another~~.

14. (Currently Amended) The rotation drive control ~~device~~ system of ~~multi-phase~~ three-phase DC motor according to claim 13, wherein the drive control unit includes a sample-and-hold signal generator which generates a ~~each of~~ sample-and-hold signal[[s]]~~, which provides timing for detecting the total current flowing through each coil, is generated so as to be synchronized~~ to synchronize with each of peak points of the ~~triangular wave information~~ positive phase triangular wave and the negative phase triangular wave so as to provide a detecting timing in connection with the current detection.

15-16. (Cancelled)

17. (New) The method of starting up a three-phase DC motor according to claim 6, further comprising a step of energizing based on the direction of energization and the corresponding phase coil by detecting only a polarity of an one phase which is subsequent to the polarity changed so as to rotate the rotor after determining normally rotation of the rotor.

18. (New) The method of starting up a three-phase DC motor according to claim 17, further comprising a step of confirming whether the rotor is rotated at a predetermined electrical degree or a predetermined number of times or more so as to proceed to the step of energizing.

19. (New) The rotation drive control device of three-phase DC motor according to claim 1, wherein when the drive control unit determinates that the detected level of the induced-voltage of each of the two of the three phase coils is larger than a predetermined level, the drive control unit determines the direction of energization and the corresponding phase coil by inverting a polarity of an induced voltage of one of the three-phase coils which is smaller than the predetermined level.

20. (New) The rotation drive control device of three-phase DC motor according to claim 1, wherein when the drive control unit determinates that the detected level of the induced-voltage of each of the two of the three phase coils is larger than the predetermined level, the drive control unit determines the direction of energization and the corresponding phase coil by ignoring a polarity of an induced voltage of one of the three-phase coils which is smaller than the predetermined level.